

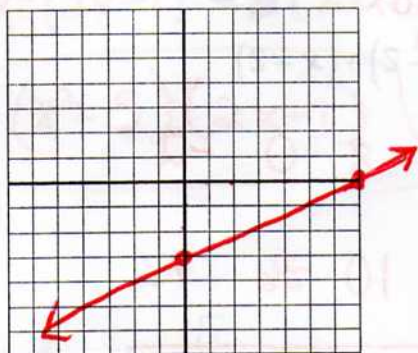
1) Solve the equation: $\frac{1}{3}(2x + 5) = 8$

$$\frac{2}{3}x + \frac{5}{3} = 8$$

$$\frac{2}{3}x = \frac{19}{3}$$

$$x = 9.5 \text{ or } \frac{19}{2}$$

3) Graph the equation: $3x - 7y = 21$



5) Write the equation of the line that passes through $(-1, 9), (1, 1)$

$$y - y_1 = m(x - x_1)$$

$$m = \frac{1-9}{1-(-1)} = \frac{-8}{2} = -4$$

$$y - 1 = -4(x - 1)$$

$$y = -4x + 4 + 1$$

$$y = -4x + 5$$

7) Simplify: $7x^{-10}y^4$

$$\frac{7y^4}{x^{10}}$$

2) Solve & graph the equation: $2|x - 2| - 8 \geq 4$

$$x - 2 \geq 6$$

$$x \geq 8$$

$$-(x - 2) \geq 6$$

$$-x + 2 \geq 6$$

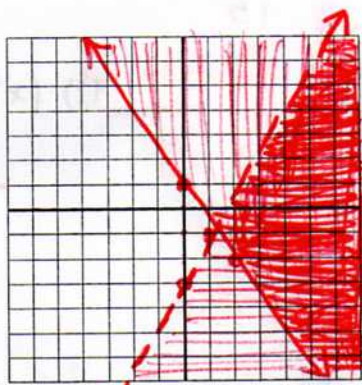
$$-x \geq 4$$

$$x \leq -4$$



4) Graph the inequality:

$$\begin{cases} y \geq -\frac{3}{2}x + 1 \\ y < 2x - 3 \end{cases}$$



6) Solve the system of equations: $3x - 4y = 5$

$$2(2x + 2y = 1)$$

$$2(1) + 2y = 1$$

$$2 + 2y = 1$$

$$2y = -1$$

$$y = -\frac{1}{2}$$

$$3x - 4y = 5$$

$$4x + 4y = 2$$

$$7x = 7$$

$$x = 1$$

$$(1, -\frac{1}{2})$$

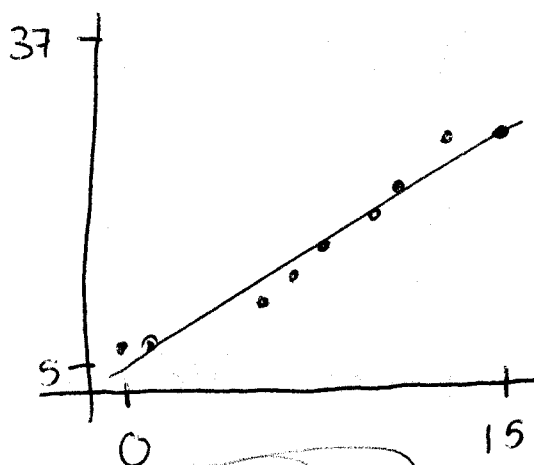
8) Simplify: $\frac{3x^2y^{-1}}{2x} \cdot \frac{10x^2y^0}{3y^{-3}} = 1$

$$5x^3y^2$$

9) Make a scatter plot of the data and approximate a best-fit line.

x	0	1	5	6	7	9	10	12	15
y	5	5	10	13	17	22	26	33	37

a) Sketch of the scatterplot and line of best fit



b) Equation of Best Fit

$$y = 2.34x + 1.79$$

c) Correlation Value and Description
(strong/weak, positive/negative)

$$r = 0.978$$

strong, positive

10) $(x-3)(x^3 - 2x^2 + 5x - 12)$

$$x^4 - 2x^3 + 5x^2 - 12x$$

$$-3x^3 + 6x^2 - 15x + 36$$

$$x^4 - 5x^3 + 11x^2 - 27x + 36$$

12) $\frac{2x^2 + x - 3}{x+1}$

$$\begin{array}{r|rrr} -1 & 2 & 1 & -3 \\ & \downarrow & -2 & 1 \\ \hline & 2 & -1 & -2 \end{array}$$

$$2x - 1 \text{ R } 2$$

For #14-18, factor each polynomial completely.

14) $x^4 - 81$

$$(x^2 - 9)(x^2 + 9)$$

$$(x+3)(x-3)(x^2 + 9)$$

11) $(x^4 - 3x^3 + 8x^2 - 2) \div (x+2)$

$$\begin{array}{r|rrrrr} -2 & 1 & -3 & 8 & 0 & -2 \\ & \downarrow & -2 & 10 & -36 & 72 \\ \hline & 1 & -5 & 18 & -36 & 70 \end{array}$$

$$x^3 - 5x^2 + 18x - 36 \text{ R } 70$$

13) $(4x^2 + 3x - 5) \div (3x^2 + 2)$

$$x^2 + 3x - 3$$

15) $x^2 - 6x + 8$

$$(x-4)(x-2)$$

For #14-18, factor each polynomial completely.

16) $x^3 - 8$ $\leftarrow (-2)^3 \div (x-2)$

17) $20x^4 - 4x^3$

$x^3(20x - 4)$

$4x^3(5x - 1)$

$$\begin{array}{r|rrrr} 2 & 1 & 0 & 0 & -8 \\ & \downarrow & 2 & 4 & 8 \\ \hline & 1 & 2 & 4 & 0 \end{array}$$

$(x^2 + 2x + 4)(x - 2)$

18) $(2x^3 - x^2)(-10x + 5)$

$x^2(2x - 1) - 5(2x - 1)$

$(x^2 - 5)(2x - 1)$

19) Simplify: $\frac{(3 - \sqrt{2})}{(4 + \sqrt{3})} \cdot \frac{(4 - \sqrt{3})}{(4 - \sqrt{3})} =$

$\frac{12 - 3\sqrt{3} - 4\sqrt{2} + \sqrt{6}}{16 + 4\sqrt{3} - 4\sqrt{3} - 3} = \frac{12 - 3\sqrt{3} - 4\sqrt{2} + \sqrt{6}}{13}$

20) Simplify: $\sqrt[4]{\frac{3}{8}}$

$\frac{\sqrt[4]{3}}{\sqrt[4]{8}} \cdot \frac{\sqrt[4]{2}}{\sqrt[4]{2}} = \frac{\sqrt[4]{6}}{2}$

21) Evaluate: $9^{-5/2}$

$\frac{1}{9^{5/2}} = \frac{1}{(\sqrt{9})^5}$
 $= \frac{1}{3^5} = \frac{1}{243}$

22) Evaluate: $\sqrt[5]{16} \cdot \sqrt[5]{4}$

$\sqrt[5]{16 \cdot 4}$
 $\begin{array}{cc} \wedge & \wedge \\ 4 & 4 \\ \wedge & \wedge \\ 2 & 2 \end{array}$

$2\sqrt[5]{2}$

23) Simplify: $5^{1/4} \cdot 5^{-9/4}$

$5^{1/4 + -9/4}$
 $= 5^{-8/4} = 5^{-2}$

$= \frac{1}{5^2} = \frac{1}{25}$

24) Simplify: $\frac{32^{2/3}}{4^{2/3}}$

$\left(\frac{32}{4}\right)^{2/3}$

$8^{2/3} =$

$(\sqrt[3]{8})^2$

$2^2 = 4$

25) Simplify: $\sqrt[6]{6x^6y^7z^8}$

* look for groups of 6

$zyx\sqrt[6]{6yz^2}$